for the person, 19% the same level of diffculty for both knees and the person, for 6% the person score was between the two knee scores and for 51% the person score was equal to one knee and either less than or greater than the other knee. Despite this heterogeneity in knee vs. person-based response patterns on individual items, correlations between total function subscale scores for the person-based version and the two total person scores calculated from knee specific score were high (Table and Figure), and did not differ for bilateral vs. unilateral knee involvement.

Conclusions: The relationship of physical function difficulty attributed to a specific knee with the effect of both knees on function at the person level is complex and highly variable. Yet, the rank ordering of subjects on total difficulty due to knee pain and arthritis is similar when assessed for the person and when calculated from both knee-specific responses. The relationship of change in physical function assessed for specific knees and at the person level needs further investigation.

324 INCIDENCE OF SEVERE KNEE AND HIP OSTEOARTHRITIS IN RELATION TO DIFFERENT MEASURES OF BODY MASS – A POPULATION-BASED PROSPECTIVE COHORT STUDY

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Purpose: The increased OA risk associated with obesity is suggested to have a significant biomechanical component, but an additional role for metabolic factors associated with adipose tissue was proposed. There are several different measures of overweight and obesity, e.g., BMI, waist circumference, waist to hip ratio and percentage of body fat. Even though these measures are positively related to each other, the measures reflect different aspects of body mass and adipose tissue distribution and type. The relationship between overweight and obesity and increased risk of knee OA is well documented. For hip OA, the evidence is inconsistent, with the association appearing stronger for case definitions based on symptoms than on radiological findings.

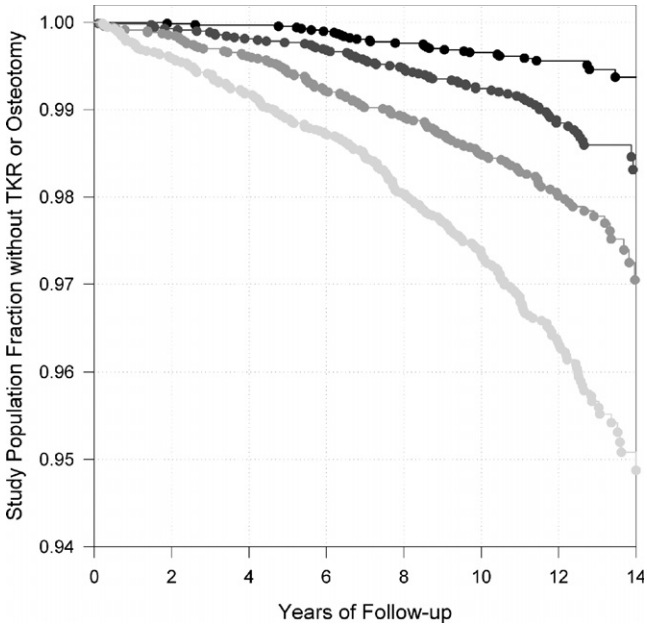
The purpose of this study was to determine in a large prospective population-based cohort study in men and women relationships between different measures of body mass and incidence of severe knee and hip OA defined as arthroplasty of knee or hip for OA.

Methods: Body mass index (BMI), waist circumference, waist-hip ratio (WHR), weight, and percentage of body fat (BF%) was measured at baseline in 11026 men and 16934 women, 45 to 73 years old, from the general population. Incidence of severe OA was defined as arthroplasty due to knee or hip OA monitored over 11 years of follow-up by linkage with the Swedish hospital discharge register. Cox' proportional hazards model was used to assess incidence of surgery due to knee or hip OA, in relation to measures of body mass, with adjustments for confounding factors. Kaplan-Meier curves were created to illustrate the crude incidence rates of knee and hip OA over time.

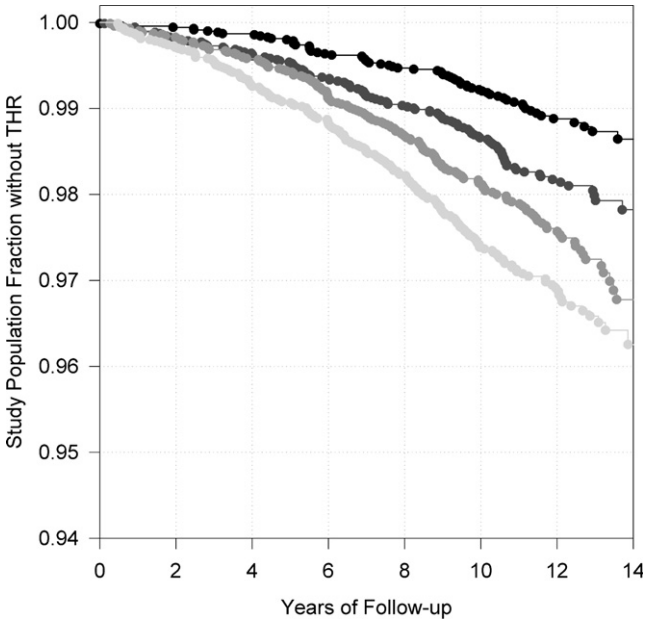
Results: During follow-up, 471 individuals had knee OA and 551 had hip OA. After adjustment for age, sex, smoking and physical activity, the relative risks (RR) of knee OA (4^{th} vs. 1^{st} quartile) were 8.1 (95% CI 5.3−12.4) for BMI, 6.7 (4.5−9.9) for waist circumference, 6.5 (4.6−9.43) for weight, 3.6 (2.6−5.0) for BF% and 2.2 (1.7−3.0) for WHR. The corresponding RR for hip OA were 2.6 (2.0−3.4) for BMI, 3.0 (2.3−4.0) for weight, 2.5 (1.9−3.3) for waist, 1.3 (0.99−1.6) for WHR and 1.5 (1.2−2.0) for BF%. These relationships persisted after adjustment for comorbidities.

Conclusions: All measures of overweight were significantly associated with incidence of knee OA leading to arthroplasty, with the strongest relative risk gradient observed for BMI. Even though incidence of hip OA showed smaller differences between normal weight and obesity, body mass was a significant risk factor also for hip OA leading to arthroplasty (Figures). There appeared to be a continuous dose response relationship between BMI and risk for arthroplasty for OA. Our results support a major link between overweight and biomechanics in increasing knee and hip OA risk in both men and women, but do not exclude a contributing role of metabolic factors associated with adipose tissue.

Kaplan-Meier survival analysis of knee and hip. Graphs show study population fractions without TKR or osteotomy for OA, and without THR for OA. For each panel, the four plots represent from top to bottom BMI quartiles 1 through 4, with a significant difference between each of the four curves. The adjusted relative risks are given in results. Median BMI values for the quartiles were 22.5/21.1, 25.0/23.6, 27.0/26.0, 30.1/30.1 for men/women.



Survival analysis. Knee.



Survival analysis. Hip.

325 C-REACTIVE PROTEIN, METABOLIC SYNDROME AND INCIDENCE OF SEVERE HIP AND KNEE OSTEOARTHRITIS. A POPULATION-BASED COHORT STUDY

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Purpose: Individuals with obesity or overweight have an increased risk of OA. The pathogenic mechanisms underlying this association are debated. There is general agreement that biomechanics and increased dynamic loading of the joint are involved, but other factors associated with obesity could contribute to the increased incidence of OA.

Obesity, hypertension, dyslipidemia, diabetes and insulin resistance tend to cluster into the so-called metabolic syndrome (MetS). These risk factors are more prevalent in patients with OA. Elevated plasma levels of C-reactive protein (CRP), a marker of low-grade systemic inflammation, is another factor frequently found in obese subjects. Increased circulating levels of CRP have been associated with prevalent and progressive knee

and hip OA and hand OA. It was proposed that systemic inflammation, possibly in combination with diabetes or insulin resistance, could increase the damage of the cartilage and impair the reparative processes. Low-grade systemic inflammation could thus be an etiological link between obesity and OA, with a possible contribution of locally produced factors produced by adipose tissue. Obesity and the metabolic syndrome could also be associated with OA through atherogeneic effects of the metabolic factors, resulting in microvascular changes in the subchondral bone.
The purpose was to explore in a prospective study the relationships between CRP, MetS and incidence of severe knee or hip OA and whether this was independent of body mass index (BMI).
Methods: A population-based cohort (n = 5171, mean age 57.5±5.9 years) was examined between 1991 and 1994. Data was collected on lifestyle habits, educational level, occupation, measures of overweight, blood pressure as well as HDL, triglycerides, glucose and CRP measured with high sensitive methods. Incidence of severe OA, defined as arthroplasty due to knee or hip OA, was monitored over 12 years of follow-up, in relation to CRP levels and presence of the MetS according to the ATPIII-NCEP definition.
Results: A total of 120 subjects had severe hip OA and 89 had severe knee OA as defined by TKR or THR for OA during the follow-up. After adjustment for age, sex, smoking and CRP, presence of MetS was associated with a significantly increased risk of knee OA (RR: 2.1, CI: 1.4−3.4). However, this relationship was attenuated and non-significant after adjustment for BMI (RR: 1.12, CI: 0.68−2.0). MetS was not significantly associated with incidence of hip OA. In women, CRP was associated with hip and knee OA in the unadjusted analysis. However, there was no significant relationship between CRP and incidence of knee or hip OA after risk factor adjustments.
Conclusions: The increased incidence of knee OA in subjects with the metabolic syndrome was largely explained by increased BMI in subjects with MetS. CRP was not associated with incidence of severe knee or hip OA leading to TKR or THR when possible confounding factors, including BMI, were taken into account.
Our results suggest that systemic inflammation *per se* is of little importance for incidence of OA, at least in association with obesity. We cannot exclude a role for local inflammation associated with excess adipose tissue in the joint. In the present study, blood for the high-sensitive CRP assay was sampled several years before OA surgery. It is possible that CRP better reflects occurrence and progression of OA in patients with established disease, than the risk of developing OA in a population-based setting.

326 A QUALITATIVE STUDY OF DECISION-MAKING IN INITIAL JOINT REPLACEMENT CONSULTATIONS

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Purpose: Total joint replacement (TJR) surgery of the hip or knee is common with over 120,000 procedures taking place annually in the UK. Assessments of pain and disease severity are widely used to allocate and prioritise patients for joint replacement surgery. However, given disparities in provision, it appears that other factors are involved in the decision-making process in secondary care. This study aims to understand the roles and experiences of patients and health care professionals at the point when decisions about surgery are made.
Methods: The study used qualitative methods to gain insight into the decision-making processes of secondary care clinicians and to elicit the experiences of people referred for consideration of primary TJR (hip or knee). Initial orthopaedic outpatient consultations were audio-recorded and observed. Brief interviews were conducted with the clinicians immediately following the consultation, and in-depth interviews conducted with the patients within one month of the consultation. In the preliminary stage of this study, 14 consultations were observed. Data collection is ongoing. Clinicians were also interviewed in-depth about their decision-making style and processes. All interviews were audio-recorded, transcribed and anonymised. The data were analysed using a thematic approach and the emergent categories were compared with the World Health Organization's (WHO) International Classification of Functioning, Disability and Health (ICF). This model incorporates impairment, activity limitation, participation restriction, environmental factors, and personal factors.
Results: Findings included the stated and observed factors in clinicians' decision-making and patients' perceptions of these. Emergent categories included assessments of disease severity, pain, movement, activities of daily living, and lifestyle; and the use of both objective and subjective measures. The findings suggest that varying emphasis is placed on each of these categories. Variation is reflected in the clinicians' decision making styles, with some placing more emphasis on activity and participation, and others placing more on pain and disease severity (impairment). Individual patient factors, and the decisions made about these, are framed within the general political and institutional context that clinicians work in. For example, the role of the 18-week patient pathway, and the length of time the patient has been experiencing symptoms prior to secondary care referral, in prioritisation decisions. Clinicians' individual consultation and decision-making styles are important in TJR decision-making. These individualities are reflected in patients' experiences.
Conclusions: Decision-making about TJR is complex and incorporates individual qualities and characteristics of patients and clinicians, as well as standard indicators. The WHO's ICF is a useful theoretical model to help understand what factors are taken into consideration when decisions are being made about which patients receive TJR and their prioritisation for surgery. Early findings from this study suggest that clinicians take activity and participation into account as well as impairment.

327 RADIOGRAPHIC FEATURES OF OSTEOARTHRITIS ARE STRONGLY ASSOCIATED WITH KNEE PAIN IN TWO COHORTS: MOST AND FRAMINGHAM

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Purpose: It has generally been accepted that there is only a modest association between radiographic features of OA and knee pain. Additionally, while osteophytes (OST) on x-rays have been associated with pain, joint space narrowing (JSN) has not, although such studies have typically used nonstandardized films which do not allow for accurate JSN assessment. Further, pain is a subjective experience that is unique to the individual. Pain sensitivity, perception and tolerance to painful stimuli differ from person to person, with various factors, such as genetic predisposition, prior experience, idiosyncratic appraisals, expectations, current mood status, and socio-cultural environment contributing to a person's response to painful stimuli. These factors confound prior studies that have examined the relation of pain with x-ray OA across individuals. We therefore examined the relation of knee pain with radiographic features of OA within persons who have knees discordant for knee pain among participants from two cohorts, a novel approach that minimizes the confounding effects of differences occurring between persons.
Methods: The Multicenter Osteoarthritis (MOST) Study is a longitudinal observational study of individuals who have or are at high risk for knee OA. The Framingham Osteoarthritis Study is a community-based cohort unselected for presence of knee OA. Both cohorts had baseline PA and lateral x-rays and a question about frequent knee pain (FKP) (pain on most of the past 30 days). Radiographis were read for Kellgren & Lawrence grade (0−4), OST (0−3), and JSN (0−3), the latter two features being read on the PA and lateral views. Maximal OST and maximal JSN grades were determined by the maximum score of each noted in either the tibiofemoral or patellofemoral joint. We identified individuals who had knees that were discordant for presence of FKP (one knee had FKP, while the other did not). Two knees within such persons formed a matched set. For this matched analysis, we used conditional logistic regression to evaluate the association of FKP with K/L grade, as well as maximal OST grade, and maximal JSN grade mutually adjusted for one another, respectively. We analyzed each cohort separately.
Results: Included were 701 persons from MOST (mean age 62, mean BMI 31, 60% female) and 291 persons from Framingham (mean age 66, mean BMI 30, 58% female). As shown in the Table, K/L grade, JSN grade, and OST grade were strongly associated with presence of FKP in each cohort, even with JSN and OST being mutually adjusted for one another. Even K/L grades 1 and 2 were associated with higher risk of FKP.
Conclusions: In both a population selected for high risk of OA as well as a community-based sample unselected for OA, K/L grade was strongly associated with FKP, even at early stages of OA. Further, JSN was more strongly associated with FKP than OST. Thus, radiographic severity as determined by K/L grades and individual radiographic features are good predictors of knee pain and accurately reflect presence of painful pathology.